

H.R. 3130, AS REPORTED
BY THE SUBCOMMITTEE ON RESEARCH
ON MAY 9, 2002

Strike all after the enacting clause and insert the following:

1 SECTION 1. SHORT TITLE.

2 This Act may be cited as the “Undergraduate
3 Science, Mathematics, Engineering, and Technology Edu-
4 cation Improvement Act”.

5 SEC. 2. FINDINGS.

6 The Congress makes the following findings:

7 (1) Studies show that about half of all United
8 States post-World War II economic growth is a di-
9 rect result of technological innovation, and science,
10 engineering, and technology play a central role in
11 the creation of new goods and services, new jobs,
12 and new capital.

13 (2) The growth in the number of jobs requiring
14 technical skills is projected to be more than 50 per-
15 cent over the next decade.

16 (3) A workforce that is highly trained in
17 science, mathematics, engineering, and technology is
18 crucial to generating the innovation that drives eco-
19 nomic growth.

1 (4) Outside of the biomedical sciences, the num-
2 ber of undergraduate degrees awarded in the
3 science, mathematics, engineering, and technology
4 disciplines has been flat or declining since 1987, de-
5 spite rapid population growth and a significant in-
6 crease in undergraduate enrollment over the same
7 period.

8 (5) The demand for H-1B visas has increased
9 over the past several years, suggesting that the
10 United States is not training a sufficient number of
11 scientists and engineers.

12 (6) International comparisons of 24-year olds
13 have shown that the proportion of natural science
14 and engineering degrees to the total of under-
15 graduate degrees is lower in the United States than
16 in Japan, South Korea, Taiwan, the United King-
17 dom, and Canada.

18 (7) Technological and scientific advancements
19 hold significant potential for elevating the quality of
20 life and the standard of living in the United States.
21 The quality and quantity of such advancements are
22 dependent on a technically trained workforce.

23 (8) Reversing the downward enrollment and
24 graduation trends in a number of science and engi-
25 neering disciplines is not only imperative to main-

1 taining our Nation's prosperity, it is also important
2 for our national security.

3 (9) The decline of student majors in science,
4 mathematics, engineering, and technology is report-
5 edly linked to poor teaching quality in these dis-
6 ciplines and lack of institutional commitment to un-
7 dergraduate education as compared to research.

8 (10) Undergraduate science, mathematics, engi-
9 neering, and technology faculty generally lack any
10 formal preparation for their role as undergraduate
11 educators. In addition, faculty members are gen-
12 erally not rewarded, and in some cases are penal-
13 ized, for the time they devote to undergraduate edu-
14 cation.

15 (11) Faculty experienced in working with un-
16 undergraduate students report that undergraduate re-
17 search experiences contribute significantly to a stu-
18 dent's decision to stay in an undergraduate science,
19 mathematics, engineering, or technology major and
20 to continue their education through graduate stud-
21 ies.

22 **SEC. 3. DEFINITIONS**

23 In this Act—

1 (1) the term “academic unit” means a depart-
2 ment, division, institute, school, college, or other
3 subcomponent of an institution of higher education;

4 (2) the term “community college” has the
5 meaning given such term in section 7501(4) of the
6 Elementary and Secondary Education Act of 1965
7 (20 U.S.C. 7601(4));

8 (3) the term “Director” means the Director of
9 the National Science Foundation;

10 (4) the term “eligible nonprofit organization”
11 means a nonprofit research institute or a nonprofit
12 professional association with demonstrated experi-
13 ence delivering science, mathematics, engineering, or
14 technology education, as determined by the Director;

15 (5) the term “institution of higher education”
16 has the meaning given such term in section 101(a)
17 of the Higher Education Act of 1965 (20 U.S.C.
18 1001(a)); and

19 (6) the term “research-grade instrumentation”
20 means a single instrument or a networked system of
21 instruments that enable publication-quality research
22 to be performed by students or faculty.

23 **SEC. 4. TECHNOLOGY TALENT.**

24 (a) **SHORT TITLE.**—This section may be cited as the
25 “Technology Talent Act of 2002”.

1 (b) GRANT PROGRAM.—

2 (1) IN GENERAL.—The Director is authorized
3 to award grants, on a competitive, merit-reviewed
4 basis, to institutions of higher education with phys-
5 ical or information science, mathematics, engineer-
6 ing, or technology programs for the purpose of in-
7 creasing the number and quality of students study-
8 ing and receiving associate or baccalaureate degrees
9 in the physical and information sciences, mathe-
10 matics, engineering, and technology. An institution
11 of higher education that is awarded a grant under
12 this section shall be known as a “National Science
13 Foundation Science and Engineering Talent Expans-
14 sion Center”.

15 (2) REQUIREMENTS.—

16 (A) NUMBER.—The Director shall award
17 not fewer than 10 grants under this section
18 each year, contingent upon available funds.

19 (B) DURATION.—Grants under this section
20 shall be awarded for a period of 5 years, with
21 the final 2 years of funding contingent on the
22 Director’s determination that satisfactory
23 progress has been made by the grantee during
24 the first 3 years of the grant period toward

1 achieving the increases in the number of stu-
2 dents proposed pursuant to subparagraph (E).

3 (C) PRINCIPAL INVESTIGATOR.—At least 1
4 principal investigator for each grant awarded
5 under this section must be in a position of ad-
6 ministrative leadership at the institution of
7 higher education, and at least 1 principal inves-
8 tigator must be a faculty member from an aca-
9 demic department included in the work of the
10 project.

11 (D) SUBSEQUENT GRANTS.—An institution
12 of higher education that has completed a grant
13 awarded under this section may apply for a
14 subsequent grant under this section.

15 (E) INCREASES.—

16 (i) INSTITUTIONS OF HIGHER EDU-
17 CATION WITH BACCALAUREATE DEGREE
18 PROGRAMS.—An institution of higher edu-
19 cation that awards baccalaureate degrees
20 and desires to receive a grant under this
21 section shall propose in its application spe-
22 cific increases in the number of students
23 who are United States citizens or perma-
24 nent resident aliens obtaining bacca-
25 laurate degrees at the institution within

1 the physical or information sciences, math-
2 ematics, engineering, or technology, and
3 shall state the mechanisms by which the
4 success of the grant project shall be as-
5 sessed.

6 (ii) COMMUNITY COLLEGES.—A com-
7 munity college that desires to receive a
8 grant under this section shall propose in
9 its application specific increases in the
10 number of students who are United States
11 citizens or permanent resident aliens pur-
12 suing degrees, concentrations, or certifi-
13 cations in the physical or information
14 sciences, mathematics, engineering, or
15 technology programs or pursuing credits
16 toward transfer to a baccalaureate degree
17 program in the physical or information
18 sciences, mathematics, engineering, or
19 technology, and shall state the mechanisms
20 by which the success of the grant project
21 shall be assessed.

22 (F) RECORDKEEPING.—Grantee institu-
23 tions shall maintain, and transmit annually to
24 the National Science Foundation, in a format
25 indicated by the Director, baseline and subse-

1 quent data on undergraduate students in phys-
2 ical and information science, mathematics, engi-
3 neering, and technology programs. Such data
4 shall include information on—

5 (i) the number of students enrolled;

6 (ii) student academic performance, in-
7 cluding quantifiable measurements of stu-
8 dents' mastery of content and skills;

9 (iii) persistence to degree completion,
10 including students who transfer from
11 science, mathematics, engineering, and
12 technology programs to programs in other
13 academic disciplines; and

14 (iv) placement during the first year
15 after degree completion in post-graduate
16 education or career pathways.

17 (G) PRIORITY.—The Director may give
18 priority in awarding grants under this section
19 to institutions of higher education whose
20 application—

21 (i) indicates a plan to build on pre-
22 vious and existing efforts with dem-
23 onstrated success, including efforts involv-
24 ing industry, in improving undergraduate
25 learning and teaching, including efforts

1 funded by Federal grants from the Na-
2 tional Science Foundation or other agen-
3 cies; and

4 (ii) provides evidence of a commitment
5 by the institution's administration to sup-
6 port and reward faculty involvement in
7 carrying out the proposed implementation
8 plan for the project.

9 (c) USES OF FUNDS.—Activities supported by grants
10 under this section may include—

11 (1) projects that specifically aim to increase the
12 number of traditionally underrepresented students in
13 the physical or information sciences, mathematics,
14 engineering, or technology, such as mentoring pro-
15 grams;

16 (2) projects that expand the capacity of institu-
17 tions of higher education to incorporate current ad-
18 vances in science and technology into the under-
19 graduate learning environment;

20 (3) bridge projects that enable students at com-
21 munity colleges to matriculate directly into bacca-
22 laureate physical or information science, mathe-
23 matics, engineering, or technology programs, includ-
24 ing those targeted at traditionally underrepresented
25 groups in such disciplines;

1 (4) projects including interdisciplinary ap-
2 proaches to undergraduate physical and information
3 science, mathematics, engineering, and technology
4 education;

5 (5) projects that focus directly on the quality of
6 student learning, including those that encourage—

7 (A) high-caliber teaching, including ena-
8 bling faculty to spend additional time teaching
9 participating students in smaller class settings,
10 particularly in the laboratory environment, by,
11 for example, providing summer salary or other
12 additional salary for faculty members or sti-
13 pends for students;

14 (B) opportunities to develop new peda-
15 gogical approaches including the development of
16 web-based course strategies, distributed and col-
17 laborative digital teaching tools, or interactive
18 course modules; and

19 (C) screening and training of teaching as-
20 sistants;

21 (6) projects that—

22 (A) facilitate student exposure to potential
23 careers, including cooperative projects with in-
24 dustry or government that place students in in-

1 ternships as early as the summer following their
2 first year of study;

3 (B) provide part-time employment in in-
4 dustry during the school year; or

5 (C) provide opportunities for undergradu-
6 ates to participate in industry or government
7 sponsored research;

8 (7) projects that assist institutions of higher
9 education in States that participate in the Experi-
10 mental Program to Stimulate Competitive Research
11 (EPSCoR) to broaden the science, engineering,
12 mathematics, and technology student base or in-
13 crease retention in these fields;

14 (8) projects to encourage undergraduate re-
15 search on-campus or off-campus;

16 (9) projects that provide financial incentives to
17 students entering and persisting in the study of
18 science, mathematics, engineering, or technology;

19 (10) projects that leverage the Federal invest-
20 ment by providing matching funds from industry,
21 from State or local government sources, or from pri-
22 vate sources; and

23 (11) other innovative approaches to achieving
24 the purpose described in subsection (b)(1).

1 (d) ASSESSMENT, EVALUATION, AND DISSEMINATION
2 OF INFORMATION.—

3 (1) PROJECT ASSESSMENT.—The Director shall
4 require each recipient of a grant awarded under this
5 section to implement project-based assessment that
6 facilitates program evaluation under paragraph (2)
7 and that assesses the impact of the project on
8 achieving the purpose stated in subsection (b)(1), as
9 well as on institutional policies and practices.

10 (2) PROGRAM EVALUATION.—Not later than
11 180 days after the date of the enactment of this Act,
12 the Director shall award at least 1 grant or contract
13 to an independent evaluative organization to—

14 (A) develop metrics for measuring the im-
15 pact of the program authorized under this sec-
16 tion on—

17 (i) the number of students enrolled;
18 (ii) student academic performance, in-
19 cluding quantifiable measurements of stu-
20 dents' mastery of content and skills;
21 (iii) persistence to degree completion,
22 including students who transfer from
23 science, mathematics, engineering, and
24 technology programs to programs in other
25 academic disciplines; and

1 (iv) placement during the first year
2 after degree completion in post-graduate
3 education or career pathways; and

4 (B) conduct an evaluation of the impacts
5 of the program described in subparagraph (A),
6 including a comparison of the funded projects
7 to identify best practices with respect to achiev-
8 ing the purpose stated in subsection (b)(1).

9 (3) DISSEMINATION OF INFORMATION.—The
10 Director, at least once each year, shall disseminate
11 information on the activities and the results of the
12 projects assisted under this section, including best
13 practices identified pursuant to paragraph (2)(B), to
14 participating institutions of higher education and
15 other interested institutions of higher education.

16 (e) REPORTS.—

17 (1) LIST.—Not later than 90 days after the
18 date of the enactment of this Act, the Director shall
19 develop, and disseminate to institutions of higher
20 education, a list of examples of existing institutional
21 and government efforts relevant to the purpose stat-
22 ed in subsection (b)(1).

23 (2) INTERIM PROGRESS REPORT.—At the end
24 of the third year of the program authorized under
25 this section, the Director shall transmit to the Con-

1 gress an interim progress report of the evaluation
2 conducted under subsection (d)(2).

3 (3) FINAL REPORT.—Not later than 6 years
4 after the date of the enactment of this Act, the Di-
5 rector shall transmit to the Congress a final report
6 of the evaluation conducted under subsection (d)(2).

7 (f) ADVISORY COMMITTEE.—

8 (1) ESTABLISHMENT.—The Director shall es-
9 tablish an advisory committee, that includes signifi-
10 cant representation from industry and academic
11 leaders, for the grant program authorized under this
12 section. The advisory committee shall—

13 (A) assist the Director in securing active
14 industry, and State and local government, par-
15 ticipation in the program;

16 (B) recommend to the Director innovative
17 approaches to achieving the purpose stated in
18 subsection (b)(1); and

19 (C) advise the Director regarding program
20 metrics, implementation and performance of the
21 program, and program progress reports.

22 (2) DURATION.—Section 14 of the Federal Ad-
23 visory Committee Act shall not apply to the advisory
24 committee established under this subsection.

1 (g) AUTHORIZATION OF APPROPRIATIONS.—There
2 are authorized to be appropriated to the National Science
3 Foundation to carry out this section—

4 (1) \$25,000,000 for fiscal year 2003; and

5 (2) such sums as may be necessary thereafter.

6 (h) RELATED PROGRAMS.—The Director shall give
7 consideration to achieving the purpose stated in subsection
8 (b)(1) by awarding grants to institutions participating in
9 the Louis Stokes Alliances for Minority Participation.

10 **SEC. 5. INSTITUTIONAL REFORM.**

11 (a) IN GENERAL.—The Director shall award grants,
12 on a merit-reviewed, competitive basis, to institutions of
13 higher education to expand previously implemented re-
14 forms of undergraduate science, mathematics, engineer-
15 ing, or technology education that have been demonstrated
16 to have been successful in increasing the number and qual-
17 ity of students studying and receiving associate or bacca-
18 laurate degrees in science, mathematics, engineering, or
19 technology.

20 (b) USES OF FUNDS.—Activities supported by grants
21 under this section may include—

22 (1) expansion of successful reform efforts be-
23 yond a single course or group of courses to achieve
24 reform within an entire academic unit;

1 (2) expansion of successful reform efforts be-
2 yond a single academic unit to other science, mathe-
3 matics, engineering, or technology academic units
4 within an institution;

5 (3) creation of multidisciplinary courses or pro-
6 grams that formalize collaborations for the purpose
7 of improved student instruction and research in
8 science, mathematics, engineering, and technology;

9 (4) expansion of undergraduate research oppor-
10 tunities beyond a particular laboratory, course, or
11 academic unit to engage multiple academic units in
12 providing multidisciplinary research opportunities
13 for undergraduate students;

14 (5) expansion of innovative tutoring or men-
15 toring programs proven to enhance student recruit-
16 ment or persistence to degree completion in science,
17 mathematics, engineering, or technology;

18 (6) improvement of undergraduate science,
19 mathematics, engineering, and technology education
20 for nonmajors, including teacher education majors;
21 and

22 (7) implementation of technology-driven reform
23 efforts, including the installation of technology to fa-
24 cilitate such reform, that directly impact under-

1 graduate science, mathematics, engineering, or tech-
2 nology instruction or research experiences.

3 (c) SELECTION PROCESS.—

4 (1) APPLICATIONS.—An institution of higher
5 education seeking a grant under this section shall
6 submit an application to the Director at such time,
7 in such manner, and containing such information as
8 the Director may require. The application shall in-
9 clude, at a minimum—

10 (A) a description of the proposed reform
11 effort;

12 (B) a description of the previously imple-
13 mented reform effort that will serve as the basis
14 for the proposed reform effort and evidence of
15 success of that previous effort, including data
16 on student recruitment, persistence to degree
17 completion, and academic performance;

18 (C) evidence of active participation in the
19 proposed project by individuals who were cen-
20 tral to the success of the previously imple-
21 mented reform effort; and

22 (D) evidence of institutional support for,
23 and commitment to, the proposed reform effort,
24 including a description of existing or planned
25 institutional policies and practices regarding

1 faculty hiring, promotion, tenure, and teaching
2 assignment that reward faculty contributions to
3 undergraduate education equal to, or greater
4 than, scholarly scientific research.

5 (2) REVIEW OF APPLICATIONS.—In evaluating
6 applications submitted under paragraph (1), the Di-
7 rector shall consider at a minimum—

8 (A) the evidence of past success in imple-
9 menting undergraduate education reform and
10 the likelihood of success in undertaking the pro-
11 posed expanded effort;

12 (B) the extent to which the faculty, staff,
13 and administrators are committed to making
14 the proposed institutional reform a priority of
15 the participating academic unit;

16 (C) the degree to which the proposed re-
17 form will contribute to change in institutional
18 culture and policy such that a greater value is
19 placed on faculty engagement in undergraduate
20 education and that a commensurate reward
21 structure is implemented to recognize faculty
22 for their scholarly work in this area; and

23 (D) the likelihood that the institution will
24 sustain or expand the reform beyond the period
25 of the grant.

1 (3) GRANT DISTRIBUTION.—The Director shall
2 ensure, to the extent practicable, that grants award-
3 ed under this section are made to a variety of types
4 of institutions of higher education.

5 (d) AUTHORIZATION OF APPROPRIATIONS.—There
6 are authorized to be appropriated to the National Science
7 Foundation to carry out this section \$15,000,000 for each
8 of fiscal years 2003 through 2007.

9 **SEC. 6. FACULTY DEVELOPMENT.**

10 (a) IN GENERAL.—The Director shall award grants,
11 on a merit-reviewed, competitive basis, to—

12 (1) institutions of higher education;

13 (2) eligible nonprofit organizations; or

14 (3) consortia of institutions and organizations
15 described in paragraphs (1) and (2),

16 for professional development of undergraduate faculty in
17 support of improved undergraduate science, mathematics,
18 engineering, and technology education.

19 (b) USES OF FUNDS.—Activities supported by grants
20 under this section may include—

21 (1) support for individuals to participate in
22 scholarly activities aimed at improving under-
23 graduate science, mathematics, engineering, and
24 technology education including—

1 (A) sabbatical funding, including partial or
2 full support for salary, benefits, and supplies,
3 for faculty participating in scholarly research
4 in—

5 (i) science, mathematics, engineering,
6 or technology;

7 (ii) the science of learning; or

8 (iii) assessment and evaluation related
9 to undergraduate instruction and student
10 performance;

11 (B) stipend support for graduate students
12 and post-doctoral fellows to participate in in-
13 structional or evaluative activities at primarily
14 undergraduate institutions; and

15 (C) release time from teaching for faculty
16 engaged in the development, implementation,
17 and assessment of undergraduate science,
18 mathematics, engineering, and technology edu-
19 cation reform activities following participation
20 in a sabbatical opportunity or faculty develop-
21 ment program described in this subsection; and

22 (2) support for institutions to develop, imple-
23 ment, and assess faculty development programs fo-
24 cused on improved instruction, mentoring, evalua-
25 tion, and support of undergraduate science, mathe-

1 matics, engineering, and technology students, includ-
2 ing costs associated with—

3 (A) stipend support or release time for fac-
4 ulty and staff engaged in the development, de-
5 livery, and assessment of the faculty develop-
6 ment program;

7 (B) stipend support or release time for fac-
8 ulty, graduate students, or post-doctoral fellows
9 from the host institution or external institutions
10 who are engaged as participants in such faculty
11 development programs; and

12 (C) support for materials, supplies, travel
13 expenses, and consulting fees associated with
14 the development, delivery, and assessment of
15 such faculty development programs.

16 (c) APPLICATIONS.—An entity seeking a grant under
17 this section shall submit an application to the Director at
18 such time, in such manner, and containing such informa-
19 tion as the Director may require. The application shall in-
20 clude, at a minimum—

21 (1) a description of the activities to be carried
22 out under the proposed project and the projected im-
23 pact of the project on undergraduate majors and
24 nonmajors enrolled in science, mathematics, engi-
25 neering, or technology courses or programs;

1 (2) a plan for assessment of the outcomes of
2 the proposed project;

3 (3) a plan for dissemination of information re-
4 garding the activities and outcomes of the proposed
5 project; and

6 (4) evidence of institutional support for imple-
7 mentation of the proposed project, including commit-
8 ment to appropriate faculty sabbaticals and release
9 time from teaching.

10 (d) ANNUAL MEETING.—The Director shall convene
11 an annual meeting of awardees under this section to foster
12 greater national information dissemination and collabora-
13 tion in the area of undergraduate science, mathematics,
14 engineering, and technology education.

15 (e) AUTHORIZATION OF APPROPRIATIONS.—There
16 are to be authorized to be appropriated to the National
17 Science Foundation to carry out this section \$8,000,000
18 for each of fiscal years 2003 through 2007.

19 **SEC. 7. ACCESS TO RESEARCH-GRADE INSTRUMENTATION.**

20 (a) IN GENERAL.—The Director shall award grants,
21 on a merit-reviewed, competitive basis, to institutions of
22 higher education to support the acquisition of research-
23 grade instrumentation and to support training related to
24 the use of that instrumentation. Instruments provided
25 through awards under this section shall be used primarily

1 for undergraduate research, undergraduate instruction, or
2 both, in science, mathematics, engineering, or technology.

3 (b) ELIGIBLE INSTITUTIONS.—Grants may be
4 awarded under this section only to institutions of higher
5 education that award fewer than 10 doctoral degrees per
6 year in disciplines for which the National Science Founda-
7 tion provides research support.

8 (c) AUTHORIZATION OF APPROPRIATIONS.—There
9 are to be authorized to be appropriated to the National
10 Science Foundation to carry out this section \$10,000,000
11 for each of fiscal years 2003 through 2007.

12 **SEC. 8. UNDERGRADUATE RESEARCH EXPERIENCES.**

13 (a) IN GENERAL.—The Director shall award grants,
14 on a merit-reviewed, competitive basis, to institutions of
15 higher education, eligible nonprofit organizations, or con-
16 sortia thereof to establish sites that provide research expe-
17 riences for 10 or more undergraduate science, mathe-
18 matics, engineering, or technology students. The Director
19 shall ensure that—

20 (1) at least half of the students participating at
21 each site funded under this section shall be recruited
22 from institutions of higher education where research
23 activities in science, mathematics, engineering, or
24 technology are limited or nonexistent;

1 (2) the awards provide undergraduate research
2 experiences in a wide range of science, mathematics,
3 engineering, or technology disciplines;

4 (3) awards support a variety of projects includ-
5 ing independent investigator-led projects, multidisci-
6 plinary projects, and multiinstitutional projects (in-
7 cluding virtual projects);

8 (4) students participating in the projects have
9 mentors, including during the academic year, to help
10 connect the students' research experiences to the
11 overall academic course of study and to help stu-
12 dents achieve success in courses of study leading to
13 a baccalaureate degree in science, mathematics, en-
14 gineering, or technology;

15 (5) mentors and students are supported with
16 appropriate summer salary or stipends; and

17 (6) all student participants are tracked through
18 receipt of the undergraduate degree and for at least
19 1 year thereafter.

20 (b) AUTHORIZATION OF APPROPRIATIONS.—There
21 are authorized to be appropriated to the National Science
22 Foundation to carry out this section \$10,000,000 for each
23 of fiscal years 2003 through 2007.

1 **SEC. 9. DISSEMINATION OF PROJECT INFORMATION.**

2 The Director shall ensure that all National Science
3 Foundation-sponsored undergraduate science, mathe-
4 matics, engineering, or technology education projects, in-
5 cluding those sponsored by National Science Foundation
6 research directorates, shall disseminate via the Internet,
7 at a minimum, the following information:

8 (1) Scope, goals, and objectives of each project.

9 (2) Activities, methodologies, and practices de-
10 veloped and implemented.

11 (3) Outcomes, both positive and negative, of
12 project assessment activities.

13 **SEC. 10. EVALUATION.**

14 (a) IN GENERAL.—The Director, through the Re-
15 search, Evaluation and Communication Division of the
16 Education and Human Resources Directorate of the Na-
17 tional Science Foundation, shall evaluate the effectiveness
18 of all undergraduate science, mathematics, engineering, or
19 technology education activities supported by the National
20 Science Foundation in increasing the number and quality
21 of students studying and receiving associate or bacca-
22 laureate degrees in science, mathematics, engineering, and
23 technology. In conducting the evaluation, the Director
24 shall consider information on—

25 (1) the number of students enrolled;

1 (2) student academic performance, including
2 quantifiable measurements of students' mastery of
3 content and skills;

4 (3) persistence to degree completion, including
5 students who transfer from science, mathematics,
6 engineering, and technology programs to programs
7 in other academic disciplines; and

8 (4) placement during the first year after degree
9 completion in post-graduate education or career
10 pathways.

11 (b) ASSESSMENT BENCHMARKS AND TOOLS.—The
12 Director, through the Research, Evaluation and Commu-
13 nication Division of the Education and Human Resources
14 Directorate of the National Science Foundation, shall es-
15 tablish a common set of assessment benchmarks and tools,
16 and shall enable every National Science Foundation-spon-
17 sored project to incorporate the use of these benchmarks
18 and tools in their project-based assessment activities.

19 (c) DISSEMINATION OF EVALUATION RESULTS.—
20 The results of the evaluations required under subsection
21 (a) shall be made available to the public.

22 (d) REPORTS TO CONGRESS.—Not later than 3 years
23 after the date of the enactment of this Act, and once every
24 3 years thereafter, the Director shall transmit to the Con-

1 gress a report containing the results of evaluations under
2 subsection (a).

3 **SEC. 11. NATIONAL ACADEMY OF SCIENCES STUDY ON UN-**
4 **DERGRADUATE RECRUITMENT AND RETEN-**
5 **TION.**

6 (a) STUDY.—Not later than 3 months after the date
7 of the enactment of this Act, the Director shall enter into
8 an arrangement with the National Research Council of the
9 National Academy of Sciences to perform a study on the
10 factors that influence undergraduate students to enter and
11 persist to degree completion in science, mathematics, engi-
12 neering, and technology programs or to leave such pro-
13 grams and matriculate to other academic programs, as re-
14 ported by students.

15 (b) TRANSMITTAL TO CONGRESS.—Not later than 18
16 months after the date of the enactment of this Act, the
17 Director shall transmit to the Congress a report con-
18 taining the results of the study under subsection (a).

19 (c) AUTHORIZATION OF APPROPRIATION.—There are
20 authorized to be appropriated to the National Science
21 Foundation for carrying out this section \$700,000 for fis-
22 cal year 2003, to remain available until expended.